DETAILED ACTION

Drawings

1. The drawings were received on 01/22/08. These drawings are accepted.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

    1. Determining the scope and contents of the prior art.
    2. Ascertaining the differences between the prior art and the claims at issue.
    3. Resolving the level of ordinary skill in the pertinent art.
    4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-24, 26, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hale (U.S. Patent No. 4,171,674) in view of Gordin et al. (U.S. Patent No. 5,398,478), and further in view of Hamilton (U.S. Patent No. 2,738,039).

5. Regarding claims 1-4:

    a. Hale discloses a fairing apparatus with the following structure: a hollow elongate fairing sleeve…rotatably secured to a support member, the hollow elongate sleeve having a shape configured to reduce aerodynamic drag

force acting on the support member ("fairing" 10, Figs. 1 and 4) [claim 1]; wherein the fairing is secured to the support by at lease one bearing joint ("collar" 104 with "bearing pads" 118, Figs. 10 and 12) [claim 2]; wherein the fairing has a first and second end with accompanying bearing joints at each end ("bearing pads" 118, Fig. 12) [claim 3]; and wherein the fairing has a lateral support structure inside the fairing sleeve comprising a plurality of bearings ("collar" 104 with "bearing pads" 118, Fig. 12) [claim 4].

b. The examiner notes that, while Hale recommends the use of his fairing in a watery medium, it is equally applicable to an open-air environment. Both air and water are fluids, and the drag on an object in either fluid is lessened if it has an aerodynamic shape (such as that of Hale's fairing). Furthermore, it is notoriously well-known in the fluids art to interchange testing in a wind tunnel and testing in a water tank when determining the Reynolds number of an object, using only a scaling factor to account for water's greater kinematic viscosity.

c. Hale does not expressly disclose that the support member to which the fairing apparatus is connected is a vertical member anchored in a foundation and subjected to an aerodynamic drag force [claim 1].

d. Gordin et al. discloses a vertical support member anchored in a foundation and subjected to an aerodynamic drag force ("pole sections" 72 and 76 with "base" 74 and "foundation" 28, Fig. 7) [claim 1]. Attaching the fairing of Hale to a vertical support member like the one taught by Gordin et al. reduces the

wind drag on the support member, allowing the member to withstand more significant drag forces due to wind velocities.

e. The examiner further notes motivation for combining the references as set forth in Hamilton: "If desired, the principal shells 51 may be enclosed in fairings of low aerodynamical resistance which are rotatable about the shells so as to offer minimum resistance to wind" (column 4, lines 2-5). The "principal shells" of Hamilton are poles, or vertical supports.

f. Moreover, the examiner notes that the vertical support element of Gordin et al. and the fairing of Hale have dimension ranges which overlap (for instance, the pole of Fig. 7 has a diameter of 13.5 in. (34.29 cm.) (Gordin et al., column 11, line 50), while the fairing has a preferred diameter range from 20 cm. to 1 m. (Hale, column 2, lines 11-15). While these ranges may be larger than a typical pole for street lights or traffic signals, the examiner notes that a change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

g. Hale in view of Gordin and Hamilton does not expressly disclose that the fairing sleeves cover an upper portion while leaving a lower portion uncovered. However, it would have been obvious to one of ordinary skill to limit the use of fairings to less than the entire length of the vertical member, in an effort to reduce materials cost.

h. Furthermore, the force of wind acting on the vertical member of Gordin is analogous to the force of a weight applied to a cantilever beam. When

applying a force to a cantilever beam, the displacement of the beam increases with the distance of the force from the supported end of the beam, with the greatest displacement occurring when the force is applied to the free end of the beam. In the instant case, the vertical member of Gordin is most adversely affected by wind that applies a force to the upper portion of the member, as the upper portion is farthest from the supported end. Since the rotatable fairings of Hale serve to decrease the force acting on the pole, it would be obvious to apply the fairings to the upper portion of the vertical member of Gordin.

i. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the motivation supplied by Hamilton to modify the vertical support element of Gordin et al. by adding the fairing of Hale in order to decrease the wind resistance and resulting drag force experienced by the support element. Furthermore, it would have been obvious to apply the fairings to only one portion of the vertical member in order to mitigate cost, and additionally would have been obvious to apply the fairings to the upper portion of the vertical member, since the force of wind acting on the upper portion results in more bending than the force of wind acting on the lower portion.

j. The examiner notes that, in an effort to eliminate unnecessary repetition of lengthy explanations, it is considered understood in all the rejections below that the added limitations of an upper portion covered by a fairing, and an

uncovered lower portion are not expressly disclosed by the combination. The motivation of Hamilton to combine Hale and Gordin, as well as the motivation for including fairings only on the upper portion of the vertical member, meet these added limitations as detailed above, and are considered to be applied to all rejections below.

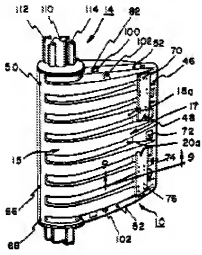


FIG. 1

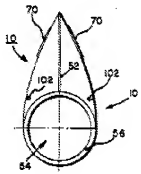


FIG. 4

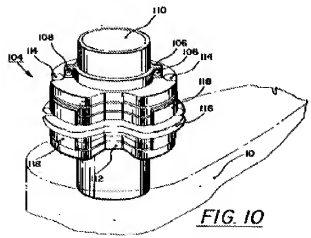


FIG. 10

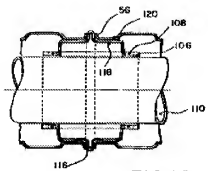
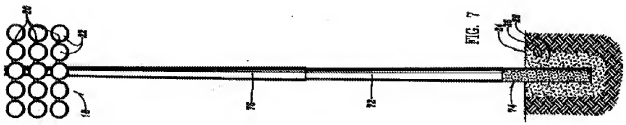


FIG. 12

Reproduced from U.S. Patent No. 4,171,674



Reproduced from U.S. Patent No. 5,398,478

6. Regarding claims 6 and 8-11:

   a. Hale discloses a fairing apparatus with the following structure: an elongate fairing sleeve having a first axis, covering a portion of a support member, configured to rotate around a support member on the first axis, and shaped to reduce aerodynamic drag force acting on the support member ("fairing" 10, Figs. 1 and 4) [claim 6]; wherein the covered portion of the vertical support has a greater drag coefficient that the fairing ("fairing" 10, Fig. 1) [claim 8]; wherein the fairing has upper and lower ends, with the lower end displaced from the foundation by a first height ("fairing" 10, Fig. 1) [claim 10]; and wherein there is included a safety shield closer to the foundation that the fairing ("collar" 104 at the bottom of "fairing" 10, Figs. 10 and 12) [claim 11].

   b. Hale does not expressly disclose that the lower portion of the support member to which the fairing apparatus is connected is anchored in a foundation and subjected to an aerodynamic drag force [claim 9].

   c. Gordin et al. discloses a vertical support member anchored in a foundation and subjected to an aerodynamic drag force ("pole sections" 72 and 76 with "base" 74 and "foundation" 28, Fig. 7) [claim 9]. Attaching the fairing of Hale to a vertical support member like the one taught by Gordin et al. reduces the

wind drag on the support member, allowing the member to withstand more significant drag forces due to wind velocities.

7. Regarding claims 1, 5, 6 and 7:

   a. Hale discloses a fairing apparatus with the following structure: a hollow elongate fairing sleeve...rotatably secured to a support member, the hollow elongate sleeve having a shape configured to reduce aerodynamic drag force acting on the support member ("fairing" 10, Figs. 1 and 4) [claim 1]; and an elongate fairing sleeve having a first axis, covering a portion of a support member, configured to rotate around a support member on the first axis, and shaped to reduce aerodynamic drag force acting on the support member ("fairing" 10, Figs. 1 and 4) [claim 6].

   b. Hale does not expressly disclose that the support member to which the fairing apparatus is connected is a vertical member anchored in a foundation and subjected to an aerodynamic drag force [claim 1], that the support member has a tapered end structure, or that the fairing sleeve has a cupped support receptacle fit to receive the tapered end [claims 5 and 7].

   c. Gordin et al. discloses: a vertical support member anchored in a foundation and subjected to an aerodynamic drag force ("pole section" 72 with "base" 74 and "foundation" 28, Fig. 7) [claim 1]; wherein the support member has a tapered end and is received by a member with a cupped support receptacle ("pole section" 72 received by "pole section" 76, Fig. 7). Attaching the fairing

of Hale to a vertical support member like the one taught by Gordin et al. reduces the wind drag on the support member, allowing the member to withstand more significant drag forces due to wind velocities. Furthermore, modifying the fairing of Hale to include a cupped receiving structure as taught by Gordin et al. allows the fairing to slip over the support member and eliminates the need for bearings in the fairing, reducing manufacturing time and cost.

d. The examiner further notes motivation for combining the references as set forth in Hamilton: "If desired, the principal shells 51 may be enclosed in fairings of low aerodynamical resistance which are rotatable about the shells so as to offer minimum resistance to wind" (column 4, lines 2-5). The "principal shells" of Hamilton are poles, or vertical supports.

e. Moreover, the examiner notes the ability of the cupped receiving structure to rotate when coupled with the tapered end support member: "As one of the major advantages of the present invention, even after this preliminary installation, the pole section 66 can virtually be adjusted 360° around base 60" (column 12, lines 4-7). While this quote refers to the embodiment in Fig. 6 (not shown), it is obvious that the same would apply to the coupling shown in Fig. 7.

f. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the motivation supplied by Hamilton to modify the vertical support element of Gordin et al. by adding the fairing of Hale in

order to decrease the wind resistance and resulting drag force experienced by the support element. Furthermore, it would have been obvious to a person of ordinary skill in the art to use the motivation supplied by Hamilton to modify the fairing of Hale by incorporating a cupped support receptacle as taught by Gordin et al. in order to eliminate the need for bearings in the fairing, saving both materials and manufacturing cost.

8. Regarding claims 6 and 12-17:

   a. Hale discloses a fairing apparatus with the following structure: the structure of claim 6 as detailed above; wherein the fairing is rotatably secured to the elongate support by at lease one bearing joint ("collar" 104 with "bearing pads" 118, Figs. 10 and 12) [claim 15]; wherein the fairing has a first and second end with accompanying bearing joints at each end ("bearing pads" 118, Fig. 12) [claim 16]; and wherein the fairing has a lateral support structure inside the fairing sleeve comprising a plurality of bearings ("collar" 104 with "bearing pads" 118, Fig. 12) [claim 17].

   b. Hale does not expressly disclose that the elongate support member to which the fairing apparatus is connected has a circular [claim 12], rectangular [claim 13], or square [claim 14] cross-section.

   c. Gordin et al. discloses a vertical elongate support member whose embodiments include a circular cross-section (Fig. 24A) [claim 12] and a square [claim 14] rectangular [claim 13] cross-section (Fig. 24B). Attaching

the fairing of Hale to a vertical support member like the one taught by Gordin et al. reduces the wind drag on the support member, allowing the member to withstand more significant drag forces due to wind velocities.

FIG. 24A

FIG. 24B

Reproduced from U.S. Patent No. 5,398,478

9. Regarding claims 18-24:

   a. Hale discloses a fairing apparatus with the following structure: an elongate support member, an elongate fairing sleeve having a longitudinal axis and covering a portion of the support member, and means for rotatably attaching the fairing sleeve to the support member ("fairing" 10 with "collar" 104, Figs. 1, 4, and 10) [claim 18]; wherein the covered portion of the vertical support has a greater drag coefficient that the fairing ("fairing" 10, Fig. 1) [claim 19]; wherein the fairing has upper and lower ends, with the lower end displaced from the foundation by a first height ("fairing" 10, Fig. 1) [claim 23]; and wherein there is included a safety shield closer to the foundation that the fairing ("collar" 104 at the bottom of "fairing" 10, Figs. 10 and 12) [claim 24].

   b. Hale does not expressly disclose that the support member to which the fairing apparatus is connected has a rectangular [claim 20], or square [claim

21] cross-section, or that it is a vertical member anchored in a foundation and subjected to an aerodynamic drag force [claim 22].

c. Gordin et al. discloses a vertical support member with a square [claim 21] rectangular [claim 20] cross-section (Fig. 24B), anchored in a foundation and subjected to an aerodynamic drag force ("pole sections" 72 and 76 with "base" 74 and "foundation" 28, Fig. 7) [claim 22]. Attaching the fairing of Hale to a vertical support member like the one taught by Gordin et al. reduces the wind drag on the support member, allowing the member to withstand more significant drag forces due to wind velocities.

d. Hale in view of Gordin and Hamilton does not expressly disclose that the fairing sleeves cover an upper portion while leaving a lower portion uncovered. However, it would have been obvious to one of ordinary skill to limit the use of fairings to less than the entire length of the vertical member, in an effort to reduce materials cost and for the reasons previously set forth.

10. Regarding claims 26 and 29:

a. The combination renders the claimed method steps obvious since such would be the logical manner of using the combination.

11. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hale (U.S. Patent No. 4,171,674) in view of Meadors (U.S. Patent No. 3,917,205), and further in view of Hamilton (U.S. Patent No. 2,738,039).

a. Hale discloses a fairing sleeve covering at least a portion of a support member and configured to rotate around the support member ("fairing" 10 with "collar" 104 and "bearing pads" 118, Figs. 1, 4, 10, and 12), and further discloses a plurality of fairings ("fairings" 10, Fig. 11) [claim 25].

b. Hale does not expressly disclose that the support member is comprised of two substantially perpendicular components, a first and second elongate support member [claim 25].

c. Meadors discloses a first elongate support member ("signal pole" 10, Fig. 1) and a second, substantially perpendicular elongate support member ("mastarm" 12, Fig. 1) attached to one another [claim 25]. Attaching the fairing of Hale to a both first and second elongate support members like the ones taught by Meadors reduces the wind drag on the support members, allowing the members to withstand more significant drag forces due to wind velocities.

d. The examiner further notes that since Hale discloses the use of a plurality of fairings, and since Meadors teaches a support member made of two distinct parts (a first and second elongate support member), then it follows that a first fairing sleeve would cover a portion of the first elongate support member, and a second fairing sleeve would cover a portion of the second elongate support member.

e. The examiner further notes motivation for combining the references as set forth in Hamilton: "If desired, the principal shells 51 may be enclosed in

fairings of low aerodynamical resistance which are rotatable about the shells so as to offer minimum resistance to wind" (column 4, lines 2-5). The "principal shells" of Hamilton are poles, or vertical supports.

f. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the motivation supplied by Hamilton to modify the vertical support element of Meadors by adding the fairing of Hale in order to decrease the wind resistance and resulting drag force experienced by the support element. Furthermore, it would have been obvious to apply fairings to both the first and second support members in order to provide superior protection against wind forces.

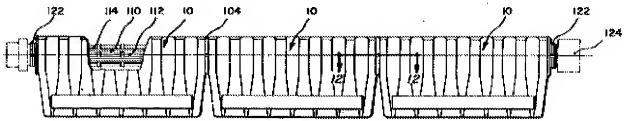


FIG. 11

Reproduced from U.S. Patent No. 4,171,674

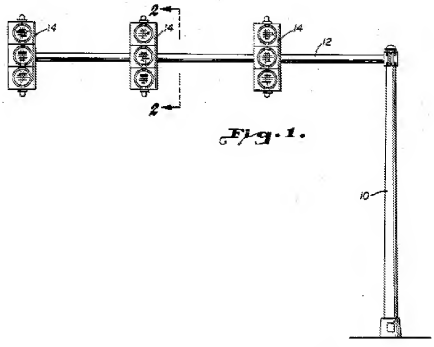


Fig. 1.

Reproduced from U.S. Patent No. 3,917,205

Response to Arguments

12. Applicant's arguments filed 01/22/08 have been fully considered but they are not persuasive.

13. Applicant argues, with respect to claims 1-24, 26, and 29, that the combination of references, and in particular Hamilton, which provides motivation to combine Hale and Gordin, does not provide motivation for placing the fairings on an upper portion of the elongate member, while leaving a lower portion of the elongate member uncovered by fairings.

14. This argument is not persuasive. Regardless of whether this specific positioning is taught by the references, it would have been obvious to one of ordinary skill in the art to position the fairings in this way. First, it would have been obvious to one of

ordinary skill to limit the use of fairings to less than the entire length of the vertical member, in order to reduce the cost of materials. Second, the examiner notes that a knowledge of basic physics well within the skill of an ordinary worker in the art would have rendered it obvious to place the fairings on an upper portion of the elongate member rather than a lower portion. The force of wind acting on the vertical member of Gordin is analogous to the force of a weight applied to a cantilever beam. When applying a force to a cantilever beam, the displacement of the beam increases with the distance of the force from the supported end of the beam, with the greatest displacement occurring when the force is applied to the free end of the beam. In the instant case, the vertical member of Gordin is most adversely affected by wind that applies a force to the upper portion of the member, as the upper portion is farthest from the supported end. Since the rotatable fairings of Hale serve to decrease the force acting on the pole, it would be obvious to apply the fairings to the upper portion of the vertical member of Gordin.

15. Since it would have been obvious to apply the fairings to only one portion of the vertical member in order to mitigate cost, and additionally would have been obvious to apply the fairings to the upper portion of the vertical member, as the force of wind acting on the upper portion results in more bending than the force of wind acting on the lower portion, the arguments are considered unpersuasive.

16. Applicant's arguments with respect to claim 25 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

19. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRANON C. PAINTER whose telephone number is (571)270-3110. The examiner can normally be reached on Mon-Fri 7:30AM-5:00PM, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Glessner can be reached on (571) 272-6843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/B. C. P./
Examiner, Art Unit 3633
04/01/08

/Brian E. Glessner/
Supervisory Patent Examiner, Art Unit 3633